What is claimed:

1. A method for identifying a substance that is likely to prevent or diminish a specific biological response in a subject having an inflammatory disease-associated genotype, said method comprising the steps of:

   a) genotyping at least one subject to identify a test subject, wherein said test subject is a subject having an inflammatory disease-associated genotype;

   b) observing in said test subject at least one biomarker;

   c) contacting said test subject with a test substance;

   d) observing again in said test subject said at least one biomarker;

   wherein a change in said at least one biomarker from an inflammatory disease-associated phenotype to a non-inflammatory disease-associated phenotype identifies a test substance that is likely to prevent or diminish the specific biological response in a subject having said inflammatory disease-associated genotype.

2. A method of claim 1, wherein said subject having an inflammatory disease-associated genotype has at least one inflammatory disease-associated allele from one of the following chromosomal regions: IL-1A, IL-1B, IL-1RN, TNFA and IL-13.

3. A method of claim 1, wherein said subject having an inflammatory disease-associated genotype has at least one inflammatory disease-associated allele from the IL-1 44112332 haplotype or the IL-1 33221461 haplotype.

4. A method of claim 1, wherein said subject having an inflammatory disease-associated genotype has at least one allele selected from the group consisting of allele 1 of IL-1A (+4845), allele 4 of IL-1A (222/223), allele 4 of IL-1A (gz5/gz6), allele 1 of IL-1A (-889), allele 2 of IL-1B (-511) , allele 3 of gaat.p33330, allele 3 of Y31, allele 2 of IL-1RN (+2018), allele 2 of IL-1RN (1731), allele 2 of IL-1RN (1812), allele 2 of IL-1RN (1868), allele 2 of IL-1RN (1887), allele 2 of IL-1RN (8006), allele 2 of IL-1RN (8061), allele 2 of IL-1RN (9589), allele 2 of IL-1A (+4845), allele 3 of IL-1A (222/223), allele 3 of IL-1A (gz5/gz6), allele 2 of IL-1A (-889), allele 1 of IL-1B (-511), allele 4 of gaat.p33330, allele 6 of Y31, allele 1 of IL-1RN (+2018),

allele 2 of IL-1B (+6912), allele 2 of TNFA (-308), allele 2 of TNFA (-238), allele 2 of IL-13 (+2581).

5. A method of claim 2, wherein said inflammatory disease-associated genotype is associated with a predisposition to one or more of the following: periodontal disease, coronary artery disease, atherosclerosis, Alzheimer's disease, osteoporosis, insulin-dependent diabetes, diabetic retinopathy, end-stage renal disease, diabetic nephropathy, hepatic fibrosis, alopecia areata, Graves' disease, Graves' opthalmopathy, extrathyroid disease, systemic lupus erythematosus, lichen sclerosis, rheumatoid arthritis, juvenile chronic arthritis, gastric cancer, ulcerative colitis, asthma, multiple sclerosis, interstitial lung disease, idiopathic pulmonary fibrosis, sepsis and acne.

6. A method of claim 1, wherein said subject having an inflammatory disease-associated genotype is homozygous for an allele selected from the group consisting of: allele 1 of IL-1A (+4845), allele 4 of IL-1A (222/223), allele 4 of IL-1A (gz5/gz6), allele 1 of IL-1A (-889), allele 2 of IL-1B (-511) , allele 3 of gaat.p33330, allele 3 of Y31, allele 2 of IL-1RN (+2018), allele 2 of IL-1RN (1731), allele 2 of IL-1RN (1812), allele 2 of IL-1RN (1868), allele 2 of IL-1RN (1887), allele 2 of IL-1RN (8006), allele 2 of IL-1RN (8061), allele 2 of IL-1RN (9589), allele 2 of IL-1A (+4845), allele 3 of IL-1A (222/223), allele 3 of IL-1A (gz5/gz6), allele 2 of IL-1A (-889), allele 1 of IL-1B (-511), allele 4 of gaat.p33330, allele 6 of Y31, allele 1 of IL-1RN (+2018), allele 2 of IL-1B (+6912), allele 2 of TNFA (-308), allele 2 of TNFA (-238), allele 2 of IL-13 (+2581).

7. A method of claim 2, wherein said at least one biomarker is selected from the group consisting of: electrocardiogram parameters, pulmonary function, core body temperature, blood or urine IL-1β levels, blood or urine IL-1α levels, blood levels of soluble IL-1 receptors, blood or urine IL-13 levels, blood or urine IL-6 levels, blood or urine TNFα levels, blood levels of stable eicosanoids, nitric oxide levels, white blood cell count, blood lipid levels, red blood cell count, platelet count, blood iron levels, blood zinc levels, blood neopterin level, blood reactive oxygen species, blood levels of C reactive protein, blood levels of fibrinogen, steroid hormone levels, standard urine parameters, size of skin erythema, duration of skin erythema.

8. A method of claim 1, further comprising administering an inducer to the test subject prior to or concomitant with each step of observing said one or more biomarkers.

9. A method of claim 8, wherein said inducer comprises exercise sufficient to cause exercise induced stress.

10. A method of claim 9, wherein said exercise is a treadmill stress test.

11. A method of claim 8, wherein said inducer comprises a subcutaneous injection of an irritant.

12. A method of claim 11, wherein said irritant induces a strong monocytic inflammatory response that is minimally influenced by an antibody response that may result from previous exposure to various antigens.

13. A method of claim 11, wherein the irritant is urate crystals.

14. A method of claim 11 wherein the irritant is monosodium urate crystals.

15. A method of claim 11, wherein said at least one biomarker includes the dimensions and/or duration of skin erythrema resulting form said subcutaneous injection.

16. A method for identifying a substance that is likely to prevent or diminish a specific biological response in a subject having an inflammatory disease-associated genotype, said method comprising the steps of:

a) genotyping at least one subject to identify a test subject, wherein said test subject is a subject having an inflammatory disease-associated genotype;

b) observing in cells obtained from said test subject, or cells propagated therefrom, at least one biomarker;

c) contacting said cells obtained from said test subject, or cells propagated therefrom, with a test substance;

d) observing again in said cells obtained from said test subject, or cells propagated therefrom, said at least one biomarker;
wherein a change in said at least one biomarker from an inflammatory disease-associated phenotype to a non-inflammatory disease-associated phenotype identifies a test substance that is likely to prevent or diminish the specific immune response in a subject having said inflammatory disease-associated genotype.

17. A method of claim 16, wherein said subject having an inflammatory disease-associated genotype has at least one inflammatory disease-associated allele from one of the following chromosomal regions: IL-1A, IL-1B, IL-1RN, TNFA and IL-13.

18. A method of claim 16, wherein said subject having an inflammatory disease-associated genotype has at least one inflammatory disease-associated allele from the IL-1 44112332 haplotype or the IL-1 33221461 haplotype.

19. A method of claim 16, wherein said subject having an inflammatory disease-associated genotype has at least one allele selected from the group consisting of allele 1 of IL-1A (+4845), allele 4 of IL-1A (222/223), allele 4 of IL-1A (gz5/gz6), allele 1 of IL-1A (-889), allele 2 of IL-1B (-511) , allele 3 of gaat.p33330, allele 3 of Y31, allele 2 of IL-1RN (+2018), allele 2 of IL-1RN (1731), allele 2 of IL-1RN (1812), allele 2 of IL-1RN (1868), allele 2 of IL-1RN (1887), allele 2 of IL-1RN (8006), allele 2 of IL-1RN (8061), allele 2 of IL-1RN (9589), allele 2 of IL-1A (+4845), allele 3 of IL-1A (222/223), allele 3 of IL-1A (gz5/gz6), allele 2 of IL-1A (-889), allele 1 of IL-1B (-511), allele 4 of gaat.p33330, allele 6 of Y31, allele 1 of IL-1RN (+2018), allele 2 of IL-1B (+6912), allele 2 of TNFA (-308), allele 2 of TNFA (-238), allele 2 of IL-13 (+2581).

20. A method of claim 16, wherein said inflammatory disease-associated genotype is associated with a predisposition to one or more of the following: periodontal disease, coronary artery disease, atherosclerosis, Alzheimer's disease, osteoporosis, insulin-dependent diabetes, diabetic retinopathy, end-stage renal disease, diabetic nephropathy, hepatic fibrosis, alopecia areata, Graves' disease, Graves' opthalmopathy, extrathyroid disease, systemic lupus

erythematosus, lichen sclerosis, rheumatoid arthritis, juvenile chronic arthritis, gastric cancer, ulcerative colitis, asthma, multiple sclerosis, interstitial lung disease, idiopathic pulmonary fibrosis, sepsis and acne.

21. A method of claim 16, wherein said subject having an inflammatory disease-associated genotype is homozygous for an allele selected from the group consisting of: allele 1 of IL-1A (+4845), allele 4 of IL-1A (222/223), allele 4 of IL-1A (gz5/gz6), allele 1 of IL-1A (-889), allele 2 of IL-1B (-511) , allele 3 of gaat.p33330, allele 3 of Y31, allele 2 of IL-1RN (+2018), allele 2 of IL-1RN (1731), allele 2 of IL-1RN (1812), allele 2 of IL-1RN (1868), allele 2 of IL-1RN (1887), allele 2 of IL-1RN (8006), allele 2 of IL-1RN (8061), allele 2 of IL-1RN (9589), allele 2 of IL-1A (+4845), allele 3 of IL-1A (222/223), allele 3 of IL-1A (gz5/gz6), allele 2 of IL-1A (-889), allele 1 of IL-1B (-511), allele 4 of gaat.p33330, allele 6 of Y31, allele 1 of IL-1RN (+2018), allele 2 of IL-1B (+6912), allele 2 of TNFA (-308), allele 2 of TNFA (-238), allele 2 of IL-13 (+2581).

22. A method of claim 16, wherein said at least one biomarker is selected from the group consisting of: IL-1α production, IL-1β production, prostanoid production, TNFα production, large-scale gene transcript level analysis, large-scale protein level analysis.

23. A method of claim 16, wherein said cells obtained from said test subject, or cells propagated therefrom, are immune cells.

24. A method of claim 16, wherein said cells obtained from said test subject, or cells propagated therefrom, are an immortalized cell line.

25. A method of claim 16, further comprising administering an inducer to the cells prior to or concomitant with each step of observing said one or more biomarkers.

26. A method of claim 25, wherein said inducer is a substance known to activate IL-1 production in monocytes or macrophages.

27. A method of claim 25, wherein said inducer comprises one or more of the following: a lipopolysaccharide, concanavalin A, phytohemagglutinin, phorbol myristic acid (PMA), a calcium ionophore, interferon gamma, interleukin-12, interleukin-1, TNFα, UV radiation, and ionizing radiation.

28. A cell comprising at least one allele that is heterologous to the genetic background of the cell line, wherein the at least one allele is an allele of IL-1A, IL-1B, IL-1RN, IL-13, or TNFA.

29. A cell of claim 28 wherein said at least one allele is associated with an inflammatory disease.

30. The cell of claim 28, wherein the at least one allele is selected from the group consisting of: allele 1 of IL-1A (+4845), allele 4 of IL-1A (222/223), allele 4 of IL-1A (gz5/gz6), allele 1 of IL-1A (-889), allele 2 of IL-1B (-511) , allele 3 of gaat.p33330, allele 3 of Y31, allele 2 of IL-1RN (+2018), allele 2 of IL-1RN (1731), allele 2 of IL-1RN (1812), allele 2 of IL-1RN (1868), allele 2 of IL-1RN (1887), allele 2 of IL-1RN (8006), allele 2 of IL-1RN (8061), allele 2 of IL-1RN (9589), allele 2 of IL-1A (+4845), allele 3 of IL-1A (222/223), allele 3 of IL-1A (gz5/gz6), allele 2 of IL-1A (-889), allele 1 of IL-1B (-511), allele 4 of gaat.p33330, allele 6 of Y31, allele 1 of IL-1RN (+2018), allele 2 of IL-1B (+6912), allele 2 of TNFA (-308), allele 2 of TNFA (-238), allele 2 of IL-13 (+2581).

31. The cell line of claim 28 that is immortalized.

32. A method for identifying a substance that is likely to prevent or diminish a specific biological response in a subject having an inflammatory disease-associated genotype, said method comprising the steps of:

a) observing in cells of claim 29 at least one biomarker;

c) contacting said cells with a test substance;

d) observing again in said cells said at least one biomarker;

wherein a change in said at least one biomarker from an inflammatory disease-associated phenotype to a non-inflammatory disease-associated phenotype identifies a test substance that is

likely to prevent or diminish the specific immune response in a subject having said allele associated with an inflammatory disease.

33. A method of claim 32, further comprising administering an inducer to the cells prior to or concomitant with each step of observing said one or more biomarkers.

34. A method of claim 33, wherein said inducer is a substance known to activate IL-1 production in monocytes or macrophages.

35. A kit for screening test substances, comprising the following:
primers for identification of one or more IL-1 polymorphisms;
materials for isolating and propagating cells; and
an inducer.

36. A kit of claim 35 wherein said inducer is one or more of the following: a lipopolysaccharide, concanavalin A, phytohemagglutinin or phorbol myristate acetate.

37. A kit for screening test substances, comprising the following:
primers for identification of one or more IL-1 polymorphisms
urate crystals; and
implements for injecting said crystals subcutaneously.